Ontario

Ontario Ministry of Agriculture and Food

2003 SUPPLEMENT

Guide to Weed Control 2002

Publication 75S

The Ontario Ministry of Agriculture and Food Web site address has been changed to www.gov.on.ca/omaf to reflect the recent ministry name change. Keep this supplement with your 2002 edition of the *Guide to Weed Control*, Publication 75. All page references in this supplement correspond to the 2002 edition.

This supplement includes information on:

New Products

- ACCENT TOTAL[1]
- BATTALION
- DESORMONE
- DIUREX 80W
- FACTOR
- SUMMIT EXTRA[1]
- TOPSIDE
- TOUCHDOWN iQ
- ULTIM TOTAL[1]

Formulation Change

SENCOR 500 F has been changed to SENCOR 480 F. See page 2 for more details.

Discontinued Products

- BLADEX L & DF
- BROADSTRIKE DUAL
- CUTRINE PLUS
- EVICT SOLUPAK
- KIL-MOR
- LENTAGRAN
- PATORAN FL
- STAMPEDE CM
- STRIKER

New Corn and Soybean Tank-Mixes

See Tables 13, 14, 18 and 19 in this supplement for a complete list of corn and soybean tank-mixes.

New Registrations

- ASSURE II — Rutabagas, Edible Beans
- PINNACLE — Tomatoes
- PRISM — Processing & Fresh Market Tomatoes

New Adjuvants

- ALLIANCE
- AQUASOFT
- AQUA-STABLE
- IN-SIGHT
- TRAMLINE
- VALID

New Section for Mustard growers

See page 27.

Discontinued Products

The following herbicides are no longer available. Disregard all references to them in Publication 75, *2002 Guide to Weed Control.*

Product name	Crops affected by product not being available
BLADEX LIQUID	Corn (field, seed and sweet)
BLADEX DF	Corn (field, seed and sweet)
BROADSTRIKE DUAL	Soybean, BROADSTRIKE DUAL MAGNUM is still available
BROADSTRIKE TREFLAN	Soybean
CUTRINE PLUS	Algae control in wholly enclosed farm, fish and fire ponds and fish hatcheries
EVICT SOLUPAK	SENCOR, LEXONE are equivalent products, See product label for specific use and rates
KIL-MOR	Spring and winter wheat, barley, corn, oats and non-crop land
LENTAGRAN	Cabbage, corn (field, seed and sweet), tomato
PATORAN FL	Soybeans, dry common beans, lima beans, snap common beans, adzuki beans and potatoes
STAMPEDE CM	Spring wheat, barley and oats
STRIKER	Corn

Change in Product Formulation

SENCOR 500 F is now being manufactured as SENCOR 480 F. This change in formulation should be noted in any treatment recommendations in the 2002 Guide to Weed Control, Publication 75, where SENCOR 500 F exists. The change in formulation **does not** affect the rate of product used per hectare. Rates that are shown for SENCOR 500 F apply also to the new formulation: SENCOR 480 F.

Additions for 2003

For the latest information on Publication 75 and weed management, visit the Ontario Ministry of Agriculture and Food's Web site and weed page at *www.gov.on.ca/OMAF/english/crops/insects/weeds.html.*

This supplement contains **new** product registrations for 2002–2003, with remarks about each treatment, as well as some corrections to products, rates and precautions. For complete information please refer to the full edition of Publication 75, *2002 Guide to Weed Control* released in January 2002. To order a copy of the 2002 Guide to Weed Control, call 1-888-466-2372. Press "1" for English or "2" for French and then "3" to order your publication.

TABLE 1. Herbicides Used in Ontario (page 52)

Common Name	Trade Name	Formulation	Guaranteed Active Ingredient	Ontario Schedule	Herbicide Grouping	Interval Before Rainfall	Winter Storage	Manufacturer Agent Codes
dichlorprop/2,4-D	DESORMONE	EC	680 g/L	2	4	4	B	NUA
diuron	DIUREX 80W	WP	80%	2	7	—	C	UAG
glyphosate	FACTOR	Sn	356 g/L	6	9	6	B	INT
glyphosate diammonium	TOUCHDOWN iQ	Sn	360 g/L	6	9	4	B	SYN
MCPB/MCPA	TOPSIDE	Sn	400 g/L	3	4	4	A	UAG
nicosulfuron + diflufenzopyr/dicamba	ACCENT TOTAL[1]	DF + WG	75% + 70%	2	2,4	4	C	DUQ
nicosulfuron + primisulfuron-methyl/dicamba	SUMMIT EXTRA[1]	DF + WG	75% + 47.4%	2	2,4	4	C	SYN
nicosulfuron/rimsulfuron + diflufenzopyr/dicamba	ULTIM TOTAL[1]	DF + WG	75% + 70%	2	2,4	4	C	DUQ
rimsulfuron + s-metolachlor/benoxacor + dicamba	BATTALION[1]	DF + EC + Sn	25% + 915 g/L + 480 g/L	2	2,15,4	2	B	DUQ
s-metolachlor/benoxacor/atrazine + glufosinate ammonium	LIBERTY PRIME[1]	SC + Sn	720 g/L + 200 g/L	2	15,5,10	4	A	SYN

[1] Indicates herbicide sold as a co-pack under this trade name.

Formulation Abbreviations: DF = dry flowable, EC = emulsifiable concentrate, Sn = solution, WG = wettable granules

Winter Storage: A = Do not allow to freeze. B = Preferably should not freeze. If frozen, return to original state by allowing product to warm to 10°C–20°C and agitate thoroughly before use. C = Not usually damaged by freezing. Store in a cool and dry place.

Ontario Scheduling: Refer to Page 63 in the Publication 75, *2002 Guide to Weed Control,* for a list of criteria for Ontario classification of pesticide products.

Manufacturer Agent Codes: Refer to the last page of this supplement for a complete list of herbicide manufacturers along with contact information.

Add this NEW table to Page 62.

TABLE 1a. Glyphosate Products and Their Registered Uses

				Glyhosate-Tolerant Crops			Preharvest Applications								
Trade name	Formulation	Guaranteed active concentration	Manufacturer	Canola	Field corn	Soybean	Barley	Beans	Canola	Flax	Foarges	Peas, field	Oats	Soybean	Wheat
CREDIT	Sn	356 g/L	NUA				✓	✓	✓	✓	✓	✓	✓	✓	✓
FACTOR	Sn	356 g/L	INT				✓	✓	✓	✓	✓	✓	✓	✓	✓
GLYFOS	Sn	356 g/L	CAU				✓	✓	✓	✓		✓		✓	✓
RENEGADE	Sn	356 g/L	MOX				✓	✓	✓	✓	✓	✓		✓	✓
ROUNDUP	Sn	356 g/L	MOX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ROUNDUP DRY	SG	64%	MOX				✓	✓	✓	✓	✓	✓	✓	✓	✓
ROUNDUP TRANSORB	Sn	360 g/L	MOX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TOUCHDOWN 480	Sn	330 g/L	SYN				✓	✓	✓			✓		✓	✓
TOUCHDOWN 600	Sn	413 g/L	SYN				✓	✓	✓	✓		✓	✓	✓	✓
TOUCHDOWN iQ	Sn	360 g/L	SYN	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VANTAGE	Sn	356 g/L	DWE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
VANTAGE PLUS	Sn	360 g/L	DWE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

TABLE 2. Herbicide Crop Rotation and Soil pH Restrictions

(Page 64)

Trade Name	Field Crops																						
	Alfalfa	Barley	Barley (underseeded)	Beans, kidney	Beans, white	Canola, including RR	Canola, IMI Smart	Clover, red	Corn, field including RR, LL, PP	Corn, Clearfield	Corn, seed	Flax-linseed	Oats	Oats (underseeded)	Peanuts	Rye, fall	Rye, fall (underseeded)	Soybeans	Sunflowers	Tobacco	Wheat, spring	Wheat, spring (underseeded)	Wheat, winter	Wheat, winter (underseeded)
	Number of months between herbicide application and planting crop																							
ACCENT TOTAL[1]	10	10	10	f	10	10	10	10	—	—	f	f	f	f	f	f	f	10	f	f	f	f	4	f
BATTALION[1]	f	10	f	f	10	10	10	10	—	—	f	f	f	f	f	f	f	10	f	f	f	f	4	f
SUMMIT EXTRA[1]	11	11	f	11	11	22	22	f	—	—	10	f	11	f	f	f	f	10	f	f	11	11	4	f
ULTIM TOTAL[1]	f	10	f	f	10	10	10	10	—	—	f	f	f	f	f	f	f	10	f	f	f	f	4	f

(Page 65)

Trade Name	Horticultural Crops																											
	Asparagus	Beans, lima	Beans, snap	Beets, red	Beets, sugar	Broccoli	Brussels sprouts	Cabbage	Carrots	Cauliflower	Celery	Corn, sweet	Cucumber	Garlic	Herbs	Lettuce	Muskmelon	Onions	Parsnips	Peas	Peppers	Potatoes	Pumpkin	Rutabaga	Spinach	Squash	Tomatoes (transplanted)	Watermelon
ACCENT TOTAL[1]	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
BATTALION[1]	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
SUMMIT EXTRA[1]	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
ULTIM TOTAL[1]	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f

BOLD = Crop rotation interval on label, intervals not indicated in bold are not on the label and are based on research information.

— = Registered for application on this crop

f = field bioassay, user assumes liability for all crops not indicated on label

[1] Indicates herbicide sold as a co-pack under this trade name.

TABLE 5. Adjuvants Used in Ontario (page 75)

Brand and Trade Names*	Type of Adjuvant	Chemical Composition	Guaranteed Active	Ontario Schedule	Winter Storage	Manufacturer Agent Codes
ALLIANCE	compatibility agent	aliphatic phosphate ester, isopropanol and glycol ethers	69%	N/A	A	NOR
AQUASOFT	water conditioning agent	hydroxy carboxylic acid, phosphoric acids and ammonium sulfate polyacrylic acid	63%	N/A	A	NOR
AQUA-STABLE	buffering agent	aliphatic polycarboxylate & calcium chloride	28%	N/A	A	NOR
IN-SIGHT	foam marker dye	dye, surfactants, and coupling agents		N/A	A	NOR
TRAMLINE	foam marker	nonionic and anionic surfactants	30%	N/A	A	NOR
VALID	drift retardant/defoamer	lecithin, emulsifiers, glycols and dimethylpolysiloxane defoamer		N/A	A	LOV

* Mention of a Brand or Trade name in this table does not constitute a guarantee or warranty of the product by the Ontario Weeds Committee. Neither does this use signify that these products are approved to the exclusion of comparable products. All trade names are capitalized. N/A = Not applicable

ADD this NEW table to Page 12

TABLE C. Adjuvant Rates per Sprayer Tank Water Volume

% Adjuvant / Water	0.1% v/v	0.2 % v/v	0.25 % v/v
L Adjuvant / L Water	1 L/1000 L	2 L/1000 L	2.5 L/1000 L
L Adjuvant / 100 U.S. gal. Water	0.38 L/100 U.S. gal.	0.76 L/100 U.S. gal.	0.95 L/100 U.S. gal.

RATE or PRECAUTION CORRECTIONS ARE HIGHLIGHTED IN BOLD.
NEW PRODUCTS ARE INDICATED AS "NEW". CROPS ARE LISTED IN THE ORDER THAT THEY APPEAR IN PUBLICATION 75, 2002 GUIDE TO WEED CONTROL.

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
Venture L (125 g/L) on many crops			
Postemergence grass herbicide (pages 195, 202, 205, 210, 218, 229, 234, 236, 237, 239, 243, 254, 256, 260, 264, 274, 276, 280, 283, 285)			
CORRECTION TO RATES (see highlighted in bold)			
fluazifop-p-butyl VENTURE L (125 g/L)	0.075 to 0.25 kg/ha 0.6 to 2 L/ha	0.24 to 0.8 L/ac	• Apply POST to actively growing grasses before tillering. • Apply at 0.6 L/ha (0.24 L/ac) at 2–5 leaf stage of volunteer corn. • Apply at 0.8 L/ha (0.32 L/ac) at 2–5 leaf stage of volunteer wheat and barley. • **Apply at 1 L/ha (0.4 L/ac) at 2–9 leaf stage of annual grasses (3–4 leaf for foxtails).** • **Apply at 2 L/ha (0.8 L/ac) at 3–5 leaf stage of quackgrass & wirestem muhly.**
Beans (Adzuki, Dry Edible, Lima, Mung)			
Postemergence grass herbicides (page 67)			
CORRECTION TO PRECAUTIONS (see highlighted in bold)			
quizalofop-p-ethyl ASSURE II (96 g/L) plus oil concentrate CANPLUS 411 or SURE-MIX	0.038 to 0.07 kg/ha 0.39 to 0.73 L/ha 5 to 10 L/1000 L 5 L/1000 L	0.15 to 0.3 L/ac 5 to 10 L/1000 L 5 L/1000 L	• Apply to emerged annual grasses and volunteer cereals in the 2-leaf to tillering stage, and volunteer corn and quackgrass in the 2–6 leaf stage. • Use the 0.39 L/ha (0.15 L/ac) rate of ASSURE II for control of volunteer corn, volunteer cereals and green foxtail. • The 0.5 L/ha (0.2 L/ac) rate of ASSURE II will suppress quackgrass and also control barnyard grass. • Use the 0.73 L/ha (0.3 L/ac) rate of ASSURE II for control of quackgrass. • Use the higher rate of CANPLUS 411 or SUREMIX when wild oats and quackgrass are the target weeds or under drought conditions. • **Now registered on all market classes.**
Postemergence broadleaf herbicides (page 67)			
CORRECTION TO PRECAUTIONS (see highlighted in bold)			
fomesafen REFLEX (240 g/L) plus adjuvant AGRAL 90	0.24 kg/ha 1 L/ha 2.5 L/1000 L	0.4 L/ac 2.5 L/1000 L	• **DO NOT** use on adzuki beans. • Apply POST when beans are in the 1–2 trifolium leaf stage. • Apply when weeds are small and actively growing. • Apply in 200–350 L water/ha (80–140 L/ac water). • **DO NOT** apply if rain is expected within 8 hr after application. • **DO NOT** apply REFLEX to any field more often than once every 2 yr. • **DO NOT** apply to crop under stress. • Some rotational cropping restrictions apply. • **DO NOT** harvest dry beans within 84 days of application. • **DO NOT** harvest snap beans within 30 days of application.

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information see Chapter 6 Notes on Herbicides and Chapter 8 Notes on Adjuvants)
Wheat (Winter) and Fall Rye			
Postemergence Grass and Broadleaf Herbicide (page 102)			
CORRECTIONS TO PRODUCT AND RATES (see highlighted in bold)			
tralkoxydim ACHIEVE 600G (60 DG) plus bromoxynil EXCIONER (280 g/L) plus mineral oil surfactant SURFACTANT	0.2 kg/ha 0.33 kg/ha 0.28 to 0.336 kg/ha 1 to 1.2 L/ha 0.2 L/100 L	0.1 kg/ac 0.4 to 0.48L/ac 0.2 L/100 L	• Use this tank mix to control wild oats and broadleaf weeds. • Apply when the wild oats are in the 1–6 leaf stage and when the winter wheat is in the 2–6 leaf stage in the fall and in the 2 to early flag leaf stage in the spring. • More effective on winter annuals when applied in the fall.
tralkoxydim ACHIEVE 600G (60 DG) plus bromoxynil/MCPA BUCTRIL M (215/240 g/L) plus mineral oil surfactant SURFACTANT	0.2 kg/ha 0.33 kg/ha 0.36 kg/ha 1 L/ha 0.2 L/100 L	0.1 kg/ac 0.4 L/ac 0.2 L/100 L	• Use this tank mix to control wild oats and broadleaf weeds. • Apply when the wild oats are in the 1–6 leaf stage and when the winter wheat is in the 2–6 leaf stage in the fall and in the 2 to early flag leaf stage in the spring.
Cream — See Tables 12 & 14 for all Registered Tank-mix Options			
Burndown and Residual Control (page 108)			
CORRECTIONS TO PRECAUTIONS (see highlighted in bold)			
atrazine GARDOBUCS NINE-O (90 WG) GARDOBUCS (480 g/L) GARDOBUCS 480 (480 g/L) plus paraquat GRAMOXONE (200 g/L)	1.25 kg/ha 1.7 kg/ha 3.08 L/ha 3.08 L/ha 0.55 to 1.1 kg/ha 2.75 to 5.5 L/ha	0.68 kg/ac 1.27 L/ac 1.27 L/ac 1.1 to 2.2 L/ac	• Apply at least 7 days prior to crop emergence. • Some perennial grass may escape (alfalfa, bromegrass and orchard grass). • Consideration should be given to follow up treatments when the corn is at the appropriate stage of growth with herbicide treatments recommended for use in the conventional tillage corn section. • **Apply in 200–250 L/ha water (80–100 L/ac).**
NEW TANK-MIXES			
atrazine GARDOBUCS NINE-O (90 WG) GARDOBUCS (480 g/L) GARDOBUCS 480 (480 g/L) plus dimethenamid FRONTIER (660 g/L) plus paraquat GRAMOXONE (200 g/L)	1.25 kg/ha 1.7 kg/ha 3.08 L/ha 3.08 L/ha 1 to 1.25 kg/ha 1.5 to 1.9 L/ha 0.55 to 0.69 kg/ha 2.75 to 3.5 L/ha	0.68 kg/ac 1.27 L/ac 1.27 L/ac 0.66 to 0.76 L/ac 1.1 to 1.4 L/ac	• Apply at least 7 days prior to crop emergence. • Some perennial grass may escape (alfalfa, bromegrass and orchard grass). • Consideration should be given to follow up treatments when the corn is at the appropriate stage of growth with herbicide treatments recommended for use in the conventional tillage corn section. • Apply in 200–250 L/ha water (80–100 L/ac). • Use higher rate of FRONTIER for heavier weed populations.

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Active Ingredient (Mode of Action Group Number) (Trade Name/ Formulation)	RATE (active ingredient) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
Postemergence Grass Herbicides (page 118)			
LABEL CHANGE (see highlighted in bold)			
nicosulfuron (ACCENT (75 DF) plus non-ionic surfactant (CERTAIN PLUS, AGRAL 90, AG-SURF or SERFACE or ADAPT OIL CONCENTRATE or MERGE or SURF-MIX plus liquid urea ammonium nitrate (UAN)	25 g/ha 50 g/ha 2L/1000 L 10 L/1000 L 5 L/1000 L 5 L/ha	 33 g/ac 2 L/1000 L 10 L/1000 L 5 L/1000 L 2 L/ac	• **Do NOT** use on seed corn or sweet corn. • **The addition of liquid urea ammonium nitrate will give control of yellow foxtail.** • Always add water soluble packages to clean water with the agitator running. Corn should be within the 1- 8 leaf stage of growth. Apply ACCENT when annual grasses are in the 1- 6 leaf stage and/or quackgrass is in the 1- 4 leaf stage (10- 20 cm). • **Do NOT** apply ACCENT to corn treated with organophosphorus insecticides.
Postemergence Grass and Broadleaf Herbicides (page 130)			
NEW PRODUCTS			
nicosulfuron plus diflufenzopyr-dicamba ACCENT TOTAL[1]	25 g/ha 0.2 kg/ha		• Apply to active growth stage of seedling broadleaf weeds (less than 7 cm tall). • Apply to annual grasses in the 1- 6 leaf stage and to quackgrass in the 3- 6 leaf stage (10 to 20 cm). • Apply when temperatures between 5°C and 28°C are predicted for the 24 hours before and after application. • **Do NOT** use on seed corn or sweet corn. • ACCENT TOTAL is a co-pack of ACCENT and DISTINCT. • **Do NOT apply to corn treated with an organophosphorus insecticide.**
(ACCENT (75 DF) plus DISTINCT (70 WG)) plus non-ionic surfactant plus liquid urea ammonium nitrate (UAN)	33 g/ha 0.265 kg/ha 2.5 L/1000 L 12.5 L/1000 L	13 g/ac 0.105 kg/ac 2.5 L/1000 L 12.5 L/1000 L	
nicosulfuron plus primisulfuron- methyl/dicamba SUMMIT EXTRA[1]	18.75g/ha 0.166 kg/ha		• Apply when corn is in the 2- 7 leaf stage. • Apply when the quackgrass is within the 3- 6 leaf stage. • Controls quackgrass and most annual broadleaf and grass weeds. • Apply when temperatures between 5°C and 28°C are predicted for the 24 hours before and after application. • **Do NOT** use on seed corn or sweet corn. • **Do NOT apply to corn treated with an organophosphorus insecticide.**
(ACCENT (75 DF) plus SUMMIT (47.4 WG)) plus non-ionic surfactant	25 g/ha 0.33 kg/ha 2 L/1000 L	10 g/ac 0.14 kg/ac 2 L/1000 L	
nicosulfuron/rimsulfuron plus diflufenzopyr-dicamba ULTIM TOTAL[1]	25 g/ha 0.2 kg/ha		• Apply to active growth stage of seedling broadleaf weeds (less than 7 cm tall). • Apply to annual grasses in the 1- 6 leaf stage and to quackgrass in the 3- 6 leaf stage (10- 20 cm). • ULTIM TOTAL is a co-pack of ULTIM and DISTINCT. • Apply when temperatures between 5°C and 28°C are predicted for the 24 hours before and after application. • **Do NOT** use on seed corn or sweet corn. • **Do NOT apply to corn treated with an organophosphorus insecticide.**
(ULTIM (25 G) 75 DF) plus DISTINCT (70 WG)) plus non-ionic surfactant plus liquid urea ammonium nitrate (UAN)	33 g/ha 0.265 kg/ha 2.5 L/1000 L 12.5 L/1000 L	13 g/ac 0.105 kg/ac 2.5 L/1000 L 12.5 L/1000 L	

[1] Indicates herbicide sold as a co-pack under this trade name.

Active ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
rimsulfuron	12.5 g/ha		• Apply at the spike to 3-leaf stage of corn.
plus s-metolachlor/benoxacor	575 g/ha		• See precautions for BANVEL II alone.
plus dicamba	300 g/ha		• Refer to individual product labels for use precautions.
BATTALION[1]			• **Do NOT** use on seed corn or sweet corn.
(ELIM EP (75 DF) plus	50 g/ha	20 g/ac	• BATTALION is a co-pack of ELIM EP, DUAL II MAGNUM and BANVEL II.
DUAL II MAGNUM (915 g/L)	0.625 L/ha	0.25 L/ac	
plus	0.625 L/ha	0.25 L/ac	• **Do NOT apply to corn treated with an organophosphorus insecticide**
BANVEL II (480 g/L))	2 L/1000 L	2 L/1000 L	
plus non-ionic surfactant			
Postemergence Grass and Broadleaf Herbicides — for Roundup Ready (glyphosate tolerant) hybrids only (page 132)			
New Tank-mixes			
glyphosate	0.9 kg/ha		• Use **ONLY** with pedigreed (certified) corn seed designated as "ROUNDUP READY CORN".
ROUNDUP TRANSORB (360 g/L)	2.5 L/ha	1 L/ac	• Apply up to and including the 5-leaf stage of corn.
plus atrazine	0.75 to 1.0 kg/ha		• Atrazine will provide residual weed control.
ATRAZINE 480 (480 g/L)	1.56 to 2.1 L/ha	0.63 to 0.85 L/ac	
ATRAZINE NINE-O (90 WG)	0.83 to 1.11 kg/ha	0.34 to 0.45 kg/ac	
glyphosate	0.9 kg/ha		• Use **ONLY** with pedigreed (certified) corn seed designated as "ROUNDUP READY CORN".
ROUNDUP TRANSORB (360 g/L)	2.5 L/ha	1 L/ac	• Apply up to and including the 5- leaf stage of corn.
plus dicamba/atrazine	1 to 1.5 kg/ha		• Marksman will provide residual weed control.
MARKSMAN ((1.2) 401 g/L)	2.5 to 3.7 L/ha	1 to 1.5 L/ac	• See precautions for BANVEL II applied POST.
Sweet Corn			
Soil applied grass and broadleaf herbicides (page 117)			
CORRECTION OF RATES (see highlighted in bold)			
s-metolachlor/benoxacor	1.14 kg/ha		• Use **ONLY** on sweet corn.
DUAL II MAGNUM (915g/L)	1.25 L/ha	0.5 L/ac	• Make **ONLY** one application per year.
plus linuron	0.38 to 0.75 kg/ha		• Apply in a minimum of 150 L water/ha.
AFOLAN F (480 g/L)	**0.79 to 1.56 L/ha**	**0.32 to 0.63 L/ac**	• **Do NOT** harvest sweet corn within 50 days of treatment.
plus atrazine	0.99 to 1.53 kg/ha		• Apply by ground equipment **ONLY**.
AATREX NINE-O (90 WG)	1.1 to 1.7 kg/ha	**0.44 to 0.68 kg/ac**	

[1] Indicates herbicide sold as a co-pack under this trade name.

TABLE 12. Field Corn Herbicide Weed Control Ratings

Trade name	Annual Grasses								Annual Broadleaves										Perennials							Crop Tolerance
	barnyard grass	crabgrass	fall panicum	foxtail, giant	foxtail, green	foxtail, yellow	old witch grass	proso millet	buckwheat, wild	cocklebur	Ragbane, Canada	lady's thumb	lamb's-quarters	mustards	nightshades, annual	pigweeds	ragweed, common	ragweed, giant	velvetleaf	bindweed, field	horsetail	milkweed	nutsedge	quackgrass	sow thistle	thistle, Canada	
Corn — soil applied grass and broadleaf herbicides																										
BATTALION[1]	9	8	9	8	8	8	9	7	9	?	?	?	9	?	8	9	9	?	8	?	?	?	?	?	?	?	G
Corn — soil applied tank-mixes																										
DUAL II MAGNUM + CONVERGE	9	9	8/9[4]	8	9	9	9	6	?	?	?	9	9	9	9	9	9	?	9	?	0	0	8	0	0	0	G
Corn — postemergence broadleaf herbicides																										
TROPOTOX PLUS, CLOVTOX PLUS, TOPSIDE	0	0	0	0	0	0	0	0	8	8	?	0	7	8	7	9	9	?	9	8	0	0	0	0	8	8	G
Corn — postemergence grass and broadleaf herbicides																										
BATTALION[1]	9	8	9	8	8	8	9	7	9	?	?	8	9	?	8	9	9	?	8	?	?	?	?	?	?	?	G
Corn — postemergence grass and broadleaf herbicides — herbicide tolerant hybrids only																										
ROUNDUP TRANSORB[3] + MARKSMAN	9	9	9	9	9	9	9	9	9	9	8	9	9	9	9	9	9	8	9	7/8	5	7	7	9	7	8	E[1]
ROUNDUP TRANSORB[3] + atrazine	9	9	9	9	9	9	9	9	9	9	8	9	9	9	9	9	9	8	9	7/8	5	7	7	9	7	8	E[1]
Corn — postemergence tank-mixes																										
ACCENT + DISTINCT, ACCENT TOTAL[1]	9	5	9	9	9	8	9	9	?	?	?	9	9	?	?	9	9	?	9	?	?	?	?	9	9	9	E
ACCENT + SUMMIT SUMMIT EXTRA[1]	9	5	9	9	9	8	9	9	?	?	?	?	9	9	6	9	9	?	9	?	?	?	?	9	?	?	G

* Various formulations exist.

[1] Indicates herbicides sold as a co-pack under this trade name.

[3] Use only on pedigree (certified) seed designated as "ROUNDUP READY" corn.

[4] Use the high rate of herbicide for optimum control.

TABLE 13. Corn Soil Applied Herbicide Tank-Mixes

common name	Trade Name	grass herbicides					broadleaf herbicides										grass and broadleaf			
		AXIOM	DUAL II MAGNUM	ERADICANE	FRONTIER	PROWL	atrazine*	BANVEL II	FIELDSTAR	MARKSMAN	AFOLAN	LINURON 480	LOROX	SENCOR	PRINCEP NINE-T	SIMADEX	SIMAZINE 480	CONVERGE [1]	PRIMEXTRA II MAGNUM	PURSUIT [2]
glyphosate (360 g/L)	CREDIT		✓																✓	
glyphosate (356 g/L)	GLYFOS		✓																✓	
glyphosate (356 g/L)	ROUNDUP		✓		✓														✓	
glyphosate (360 g/L)	ROUNDUP TRANSORB		✓		✓														✓	
glyphosate (356 g/L)	RENEGADE		✓																✓	
glyphosate (330 g/L)	TOUCHDOWN 480/600		✓		✓	✓			✓		✓							✓	✓	
glyphosate (360 g/L)	TOUCHDOWN iQ		✓		✓	✓			✓		✓	✓	✓						✓	
glyphosate (356 g/L)	VANTAGE		✓																✓	
glyphosate (360 g/L)	VANTAGE PLUS		✓																✓	
paraquat	GRAMOXONE		✓		✓		✓												✓	
soil applied grass herbicides																				
flufenacet/metribuzin	AXIOM						✓	✓		✓										
s-metolachlor	DUAL II MAGNUM						✓	✓	✓	✓										
EPTC+	ERADICANE						✓		✓					✓						
dimethenamid	FRONTIER						✓	✓	✓	✓										
pendamethalin	PROWL						✓	✓	✓	✓										✓
soil applied broadleaf herbicides																				
atrazine	atrazine*	✓	✓	✓	✓	✓		✓				✓	✓							✓
dicamba	BANVEL II	✓	✓		✓	✓	✓												✓	✓
flumetsulam/clopyralid	FIELDSTAR		✓	✓	✓	✓													✓	
dicamba/atrazine	MARKSMAN	✓	✓		✓	✓														
linuron	AFOLAN F																		✓	
linuron	LINURON 480						✓												✓	
linuron	LOROX						✓												✓	
metribuzin	SENCOR			✓																
simazine	PRINCEP NINE-T																			
simazine	SIMADEX																			
simazine	SIMAZINE 480																			
soil applied grass and broadleaf herbicides																				
isoxaflutole/atrazine	CONVERGE [1]																			
s-metolachlor/atrazine	PRIMEXTRA II MAGNUM							✓	✓		✓	✓	✓							
imazethapyr	PURSUIT [2]					✓	✓	✓												
soil applied grass and broadleaf herbicides — for Roundup Ready (glyphosate tolerant) hybrids only																				
glyphosate (360 g/L)	ROUNDUP TRANSORB						✓			✓										

Registered 3-Herbicide Tank-Mixes

DUAL II MAGNUM + AFOLAN F + AATREX NINE O
DUAL II MAGNUM + BANVEL II + atrazine
ROUNDUP + FRONTIER + atrazine
ROUNDUP + FRONTIER + MARKSMAN
ROUNDUP, GLYFOS, TOUCHDOWN + DUAL II MAGNUM + atrazine

[1] CONVERGE is a co-pack of CONVERGE 75 (isoxaflutole) and CONVERGE 480 (atrazine)

[2] Use only on the appropriate herbicide-tolerant hybrids.

* Various products and formulations available

TABLE 14. Corn Postemergence Herbicide Tank-Mixes

common name	TRADE NAME	grass herbicides						broadleaf herbicides																		grass and broadleaf									
																											herbicide tolerant only									
		ACCENT	DUAL II MAGNUM	ELIM EP	FRONTIER	PROWL	ULTIM	2,4-D*	2,4-DB*	atrazine*	BANVEL II	BASAGRAN FORTE	BUCTRIL M,	DISTINCT	FIELDSTAR	KORIL	LADDOK	MARKSMAN	MCPA *	MCPB/MCPA *	PARDNER	PEAK [1]	PEAKPLUS [1]	SHOTGUN	STRIKER	SUMMIT	TROPOTOX PLUS	ACCENT 1-PASS [1]	ACCENT TOTAL [1]	BATTALION [1]	PRIMEXTRA II	SUMMIT EXTRA [1]	ULTIM TOTAL [1]	ULTIMAX [1]	LIBERTY 200 SN [2]	LIBERTYPRIME [1,2]	PATRIOT [2]	PURSUIT [2]	ROUNDUP [2]	ROUNDUP	VANTAGE [2]	VANTAGE PLUS [2]
postemergence grass herbicides																																							
nicosulfuron	ACCENT										✓			✓				✓			✓		✓	✓		✓														
s-metolachlor	DUAL II MAGNUM									✓	✓							✓																						
rimsulfuron	ELIM EP					✓					✓							✓						✓																
dimethenamid	FRONTIER									✓	✓							✓																						
pendimethalin	PROWL			✓						✓	✓							✓																	✓		✓			
nicosulfuron/ rimsulfuron	ULTIM										✓			✓				✓			✓		✓	✓	✓														
postemergence broadleaf herbicides																																							
2,4-D	2,4-D*										✓																												
2,4-DB	2,4-DB*																																						
atrazine	atrazine*		✓		✓	✓					✓		✓			✓					✓	✓											✓	✓				✓		
dicamba	BANVEL II	✓	✓	✓	✓	✓	✓	✓		✓											✓	✓									✓			✓		✓			
bentazon	BASAGRAN FORTE																																						
bromoxynil/MCPA	BUCTRIL M, MEXTROL									✓																														
MCPA/MCPB	CLOVITOX PLUS																																						
dicamba/diflufenzopyr	DISTINCT	✓					✓																																
flumetsulam/ clopyralid	FIELDSTAR																														✓								
bromoxynil	KORIL									✓																														
bentazon/ atrazine	LADDOK																																						
dicamba/ atrazine	MARKSMAN	✓	✓	✓	✓	✓	✓																													✓		✓	✓	
MCPA	MCPA *																																						
bromoxynil	PARDNER	✓					✓			✓	✓											✓																	
prosulfuron + dicamba	PEAKPLUS [1]	✓					✓																																
primisulfuron + dicamba	SUMMIT	✓																																					
atrazine/2,4-D	SHOTGUN	✓		✓			✓																																
MCPA/MCPB	MCPA/MCPB *																																						
postemergence grass and broadleaf herbicides																																							
nicosulfuron + prosulfuron + dicamba	ACCENT 1-PASS [1]																																						
nicosulfuron + dicamba/diflufenzopyr	ACCENT TOTAL [1]																																						
nicosulfuron/rimsulfuron + flumetsulam/clopyralid/2,4-D	ULTIMAX [1]									✓																														
nicosulfuron/rimsulfuron + dicamba/diflufenzopyr	ULTIM TOTAL [1]																																						

TABLE 14. Corn Postemergence Herbicide Tank-Mixes

common name	TRADE NAME	grass herbicides						broadleaf herbicides																				grass and broadleaf		herbicide tolerant only							
		ACCENT	DUAL II MAGNUM	ELIM EP	FRONTIER	PROWL	ULTIM	2,4-D*	2,4-DB*	atrazine*	BANVEL II	BASAGRAN FORTE	BUCTRIL M.	DISTINCT	FIELDSTAR	KORIL	LADDOK	MARKSMAN	MCPA *	MCPB/MCPA *	PARDNER	PEAK [1]	PEAKPLUS [1]	SHOTGUN	STRIKER	SUMMIT	TROPOTOX PLUS	ACCENT 1-PASS [1]	ACCENT TOTAL [1]	BATTALION [1]	PRIMEXTRA II	SUMMIT EXTRA [1]	ULTIM TOTAL [1]	ULTIMAX [1]	LIBERTY 200 SN [2]	LIBERTYPRIME [1,2]	PATRIOT [2]	PURSUIT [2]	ROUNDUP [2]	ROUNDUP	VANTAGE [2]	VANTAGE PLUS [2]
rimsulfuron + s-metolachlor/benoxacor + dicamba	BATTALION[1]																																						
s-metolachlor/ atrazine	PRIMEXTRA II MAGNUM										✓				✓																									
postemergence grass and broadleaf herbicides — herbicide tolerant hybrids only																																							
glufosinate ammonium	LIBERTY 200 SN [2]					✓				✓	✓							✓																					
glufosinate ammonium + s-metolachlor/ atrazine	LIBERTYPRIME [1,2]																																						
imazethapyr/ atrazine	PATRIOT [2]																																						
imazethapyr/ atrazine	PURSUIT [2]					✓					✓							✓																					
glyphosate	ROUNDUP [2]																																						
glyphosate	ROUNDUP TRANSORB [2]									✓								✓																					
glyphosate	VANTAGE [2]																																						
glyphosate	VANTAGE PLUS [2]																																						

Registered 3-Herbicide Tank mixes

ACCENT + PEAKPLUS
ELIM EP + PROWL + BANVEL II
ULTIM + PARDNER + atrazine
ULTIM + PEAKPLUS
ULTIMAX + atrazine

[1] **Co-Packs**

ACCENT 1-PASS is a co-pack of ACCENT and PEAKPLUS
ACCENT TOTAL is a co-pack of ACCENT and DISTINCT
BATTALION is a co-pack of ELIM EP, DUAL II MAGNUM and BANVEL II
LIBERTYPRIME is a co-pack of LIBERTY and PRIMEXTRA II MAGNUM
PEAKPLUS is a co-pack of PEAK and BANVEL II
SUMMIT EXTRA is a co-pack of SUMMIT and ACCENT
ULTIMAX is a co-pack of ULTIM and MAX
ULTIM TOTAL is a co-pack of ULTIM and DISTINCT

* Various products and formulations available
[1] Indicates product sold as co-pack
[2] Use only on the appropriate herbicide tolerant hybrids

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
Direct Seeded Forages in Seeding Year			
Postemergence Broadleaf Herbicides (page 148)			
CORRECTION TO PRECAUTIONS (see highlighted in bold)			
2,4-DB	1.1 to 1.4 kg/ha		▪ Apply in at least 150 L/ha (60 L/ac) water, when alfalfa, bird's-foot trefoil or clovers are in the 1–4 leaf stage and seedling forage grasses are at the 2-4 leaf stage. ▪ **Do NOT** graze or cut legumes for hay in the year of treatment with CALIBER and within 30 days of treatment with COBUTOX and EMBUTOX. ▪ **NOT intended for grass forage crops grown for hay or grazing in the year of application.** ▪ **Do NOT** apply to crops grown for seed. ▪ **Do NOT apply under drought conditions.** ▪ 2,4-DB usually suppresses legume growth for a period of 2–3 weeks. ▪ Severe injury to legumes may occur under drought, high temperature or other stress conditions.
CALIBER 400 (400 g/L)	2.75 to 3.5 L/ha	1.1 to 1.4 L/ac	
COBUTOX 600 (600 g/L)	1.8 to 2.3 L/ha	0.72 to 0.92 L/ac	
EMBUTOX 625 (625 g/L)	1.75 to 2.25 L/ha	0.7 to 0.9 L/ac	
PRODUCT ADDITION / CORRECTION TO PRECAUTIONS (see highlighted in bold)			

MCPB/MCPA (15:1)	1.1 to 1.7 kg/ha		▪ **Apply when clovers are at the unifoliate to the 4th trifoliate leaf stage and seedling forage grasses are at the 2-4 leaf stage.**
			▪ Clovers may be suppressed for 2–3 weeks.
			▪ **Do NOT exceed 3.5 L/ha of TOPSIDE for seedling forage grasses**
			▪ **Do NOT apply TOPSIDE and TROPOTOX PLUS in less than 150 L/ha (60 L/ac) of water.**
			▪ **Do NOT apply CLOVITOX PLUS in less than 175 L/ha (70 L/ac) of water.**
			▪ **Do NOT apply CLOVITOX PLUS when temperatures exceed 27°C.**
			▪ **For CLOVITOX PLUS and TOPSIDE**
			  ▪ **Do NOT apply under drought conditions.**
			  ▪ **Do NOT** graze or cut for forage in the year of application.

CLOVITOX PLUS (400 g/L)	2.75 to 4.25 L/ha	1.1 to 1.7 L/ac	
TROPOTOX PLUS (400 g/L)	2.75 to 4.25 L/ha	1.1 to 1.7 L/ac	
TOPSIDE (400 g/L)	**2.75 to 4.25 L/ha**	**1.1 to 1.7 L/ac**	
Forage Legumes (Established)			
Postemergence Broadleaf Herbicides (page 149)			
CORRECTION TO PRECAUTIONS (see highlighted in bold)			
2,4-DB	1.4 to 1.7 kg/ha		▪ For pure stands or mixtures containing alfalfa or bird's-foot trefoil apply as spot treatment or when regrowth after cutting or grazing is not more than 7 cm high. ▪ **Do NOT graze or cut for hay in the year of treatment with Caliber and within 30 days of treatment with Cobutox and Embutox.** ▪ Do NOT apply to crops grown for seed. ▪ Apply in at least 150 L/ha (60 L/ac) water.
CALIBER 400 (400 g/L)	3.5 to 4.25 L/ha	1.4 to 1.7 L/ac	
COBUTOX 600 (600 g/L)	2.3 to 2.8 L/ha	0.92 to 1.12 L/ac	
EMBUTOX 625 (625 g/L)	2.25 to 2.75 L/ha	0.9 to 1.1 L/ac	

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
Pastures (Mostly Grasses)			
Postemergence Biennial and Perennial Weed Herbicides (page 152)			
CORRECTION TO PRECAUTIONS (see highlighted in bold)			

2,4-DB	1.72 kg/ha		• **Nodding, Scotch, or bull thistles, perennial sow thistle, and chicory: Apply to rosette stage.**
			• **Yellow rocket: Apply in fall.**
			• **Plantains: Apply before flowering.**
			• **Curled dock: Apply to early growth.**
			• **Top growth only controlled for:**
			  • **Canada thistle: Apply when 15 cm high to early bud stage.**
			  • **Field bindweed: Apply in late summer.**
			  • **Dandelion: Apply before bud stage.**
			  • **Horsetail: Apply at 10–12 cm tall.**
			• **Do NOT graze or cut for forage in the year of treatment.**

CALIBER 400 (400 g/L)	4.25 L/ha	1.7 L/ac	
COBUTOX 600 (600 g/L)	2.8 L/ha	1.12 L/ac	
EMBUTOX 625 (625 g/L)	2.75 L/ha	1.1 L/ac	
PRODUCT ADDITION / CORRECTION TO PRECAUTIONS (see highlighted in bold)			

MCPB/MCPA	1.7 kg/ha		• **Controls top growth of weeds only.**
			• **Canada thistle: Apply when 15 cm high to early bud stage.**
			• **Curled dock, plantains and perennial sow thistle: Apply to rosette stage.**
			• **Buttercup and field bindweed: Apply in spring.**
			• **Horsetail: Apply when 15 cm high.**
			• **This treatment has some safety on legumes.**
			• **Apply TOPSIDE after grazing or cutting when weeds are at a susceptible stage.**
			• **Do NOT apply TOPSIDE and TROPOTOX PLUS in less than 150 L/ha (60 L/ac) of water.**
			• **Do NOT apply CLOVITOX PLUS in less than 175 L/ha (70 L/ac) of water.**
			• **Do NOT apply CLOVITOX PLUS when temperatures exceed 27 °C.**
			• **For CLOVITOX PLUS and TOPSIDE**
			  • **Do NOT apply under drought conditions.**
			  • **Do NOT graze or harvest for forage in the year of application.**

CLOVITOX PLUS (400 g/L)	4.25 L/ha	1.7 L/ac	
TROPOTOX PLUS (400 g/L)	4.25 L/ha	1.7 L/ac	
TOPSIDE (400 g/L)	**4.25 L/ha**	**1.7 L/ac**	
Soybeans — See Tables 18 & 19 for all Registered Tank-mix Options			
Burndown and Residual Control (page 157)			
dimethenamid	1 to 1.25 kg/ha		• Apply at least 3 days prior to crop emergence. • Some perennial species may escape (alfalfa, bromegrass and orchard grass). • Consideration should be given to follow up treatments when soybeans are at the appropriate stage of growth with herbicide treatments recommended for use in the conventional tillage soybean section. • Apply in 200–250 L/ha water (80–100 L/ac). • Use higher rate of FRONTIER for heavier weed populations.
FRONTIER (900 g/L)	1.1 to 1.4 L/ha	0.44 to 0.56 L/ac	
plus paraquat	0.55 to 0.8 kg/ha		
GRAMOXONE (200 g/L)	2.75 to 4 L/ha	1.1 to 1.6 L/ac	

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants)
linuron LINURON 480 (480 g/L) or AFOLAN F (480 g/L) or LOROX DF (50DF) plus paraquat GRAMOXONE (200 g/L)	0.9 to 1.1 kg 1.9 to 2.3 L/ha 1.9 to 2.3 L/ha 1.8 to 2.2 kg/ha 0.5 kg/ha 2.5 L/ha	 1 to 1.8 L/ac 1 to 1.8 L/ac 0.72 to 0.88 kg/ac 1 L/ac	• Apply PRE but no later than 3 days prior to crop emergence. • See GRAMOXONE application instructions in the "**Preplant Site Preparation**" section. • **Do NOT** use on sands (less than 2%–3% organic matter). • Plant soybeans at least 4 cm deep.
metribuzin SENCOR 75 DF (75 WG) LEXONE DF (75 DF) plus paraquat GRAMOXONE (200 g/L)	0.56 to 1.12 kg/ha 0.75 to 1.5 kg/ha 0.75 to 1.5 kg/ha 0.5 kg/ha 2.5 L/ha	 0.3 to 0.6 kg/ac 0.3 to 0.6 kg/ac 1 L/ac	• Apply PRE but no later than 3 days prior to crop emergence. • See GRAMOXONE application instructions in the "**Preplant Site Preparation**" section. • **Do NOT** apply to coarse textured soils with less than 2% OM. • **Do NOT** apply to metribuzin sensitive varieties.
s-metolachlor DUAL MAGNUM (915 g/L) plus paraquat GRAMOXONE (200 g/L)	1.05 to 1.6 kg/ha 1.15 to 1.75 L/ha 0.55 to 0.8 kg/ha 2.75 to 4 L/ha	 0.46 to 0.7 L/ac 1.1 to 1.6 L/ac	• Apply at least 3 days prior to crop emergence. • Some perennial species may escape (alfalfa, bromegrass and orchard grass). • Consideration should be given to follow up treatments when the soybeans are at the appropriate stage of growth with herbicide treatments recommended for use in the conventional tillage soybean section. • Apply in 200–250 L/ha water (80–100 L/ac). • Use higher rate of DUAL MAGNUM for heavier weed populations.
s-metolachlor DUAL MAGNUM (915 g/L) plus paraquat GRAMOXONE (200 g/L) plus linuron LINURON 480 (480 g/L) or AFOLAN F (480 g/L) or LOROX DF (50DF)	1.05 to 1.6 kg/ha 1.15 to 1.75 L/ha 0.55 to 0.8 kg/ha 2.75 to 4 L/ha 0.9 to 1.1 kg 1.9 to 2.3 L/ha 1.9 to 2.3 L/ha 1.8 to 2.2 kg/ha	 0.46 to 0.7 L/ac 1.1 to 1.6 L/ac 1 to 1.8 L/ac 1 to 1.8 L/ac 0.72 to 0.88 kg/ac	• Apply at least 3 days prior to crop emergence. • Some perennial species may escape (alfalfa, bromegrass and orchard grass). • Consideration should be given to follow up treatments when the soybeans are at the appropriate stage of growth with herbicide treatments recommended for use in the conventional tillage soybean section. • Apply in 200–250 L/ha water (80–100 L/ac). • Use higher rate of DUAL MAGNUM for heavier weed populations. • **Do NOT** use on sands (less than 2–3% OM). • Plant soybeans at least 4 cm deep. • Use higher rate of linuron for muck soils and clay soils.
s-metolachlor DUAL MAGNUM (915 g/L) plus paraquat GRAMOXONE (200 g/L) plus Metribuzin SENCOR 75 DF	1.05 to 1.6 kg/ha 1.15 to 1.75 L/ha 0.55 to 0.8 kg/ha 2.75 to 4 L/ha 0.56 to 1.2 kg/ha 0.75 to 1.5 kg/ha	 0.46 to 0.7 L/ac 1 to 1.6 L/ac 0.3 to 0.6 kg/ac	• Apply at least 3 days prior to crop emergence. • Some perennial species may escape (alfalfa, bromegrass and orchard grass). • Consideration should be given to follow up treatments when the soybeans are at the appropriate stage of growth with herbicide treatments recommended for use in the conventional tillage soybean section. • Apply in 200–250 L/ha water (80–100 L/ac). • Use higher rate of DUAL MAGNUM for heavier weed populations. • **Do NOT** apply to coarse textured soils with less than 2% OM. • **Do NOT** apply use on metribuzin sensitive varieties.

Active ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants)
flufenacet/ metribuzin AXIOM (60 DF) plus glyphosate ROUNDUP (356 g/L)	0.76 to 1 kg/ha 1.12 to 1.47 kg/ha 0.89 kg/ha 2.5 L/ha	0.45 to 0.59 kg/ac 1 L/ac	• Apply PREPLANT SURFACE (up to 7 days before planting) or PRE. • Plant soybeans at least 4 cm deep. • **Do NOT** apply to coarse textured soils. • Adjust application rate according to soil texture as per product label. • **Do NOT** use on metribuzin sensitive varieties. See "Ontario Soybean Variety Trials" brochure. • The level of quackgrass normally achieved with Roundup may be reduced with this tank-mix.
flufenacet/ metribuzin AXIOM plus imazethapyr PURSUIT plus glyphosate ROUNDUP (356 g/L)	0.76 to 0.86 kg/ha 1.12 to 1.26 kg/ha 0.075 kg/ha 0.300 L/ha 0.89 kg/ha 2.5 L/ha	0.45 to 0.5 kg/ac 0.125 L/ac 1 L/ac	• Apply PREPLANT SURFACE (up to 7 days prior to planting) or PRE. • Plant soybeans at least 4 cm deep. • Some rotational cropping restrictions apply (see Table 2). • **Do NOT** apply to coarse textured soils. • Adjust application rate according to soil texture as per product label. • **Do NOT** use on metribuzin sensitive varieties. See "Ontario Soybean Variety Trials" brochure. • The level of quackgrass normally achieved with Roundup may be reduced with this tank-mix.
flufenacet/ metribuzin AXIOM (60 DF) plus linuron LORON DF (50 DF) plus glyphosate ROUNDUP (356 g/L)	0.76 to 0.86 kg/ha 1.12 to 1.26 kg/ha 1.0 to 1.15 kg/ha 2.0 to 2.3 kg/ha 0.89 kg/ha 2.5 L/ha	0.45 to 0.5 kg/ac 0.81 to 0.92 kg/ac 1 L/ac	• Apply PREPLANT SURFACE (up to 7 days prior to planting) or PRE. • Plant soybeans at least 4 cm deep. • **Do NOT** apply to coarse textured soils. • Adjust application rate according to soil texture as per product label. • **Do NOT** use on metribuzin sensitive varieties. See "Ontario Soybean Variety Trials" brochure. • The level of quackgrass normally achieved with Roundup may be reduced with this tank-mix.
flufenacet/ metribuzin AXIOM (60 DF) plus metribuzin SENCOR 75 DF (75 WG) plus glyphosate ROUNDUP (356 g/L)	0.76 to 0.86 kg/ha 1.12 to 1.26 kg/ha 0.49 to 0.62 kg/ha 0.65 to 0.83 kg/ha 0.89 kg/ha 2.5 L/ha	0.45 to 0.5 kg/ac 0.26 to 0.33 kg/ac 1 L/ac	• Apply PPI (up to 7 days prior to planting), PREPLANT SURFACE (up to 7 days before planting) or PRE. • Plant soybeans at least 4 cm deep. • **Do NOT** apply to coarse textured soils. • Adjust application rate according to soil texture as per product label. • **Do NOT** use on metribuzin sensitive varieties. See "Ontario Soybean Variety Trials" brochure. • The level of quackgrass normally achieved with Roundup may be reduced with this tank-mix.
flufenacet/ metribuzin AXIOM (60 DF) plus metribuzin SENCOR 75 DF (75 WG) plus linuron LORON DF (50 DF) plus glyphosate ROUNDUP (356 g/L)	0.76 to 0.86 kg/ha 1.12 to 1.26 kg/ha 0.45 to 0.49 kg/ha 0.6 to 0.65 kg/ha 0.85 to 1 kg/ha 1.7 to 2 kg/ha 0.89 kg/ha 2.5 L/ha	0.45 to 0.5 kg/ac 0.24 to 0.26 kg/ac 0.69 to0.8 kg/ac 1 L/ac	• Apply PREPLANT SURFACE (up to 7 days prior to planting) or PRE. • Plant soybeans at least 4 cm deep. • **Do NOT** apply to coarse textured soils. • Adjust application rate according to soil texture as per product label. • **Do NOT** use on metribuzin sensitive varieties. See "Ontario Soybean Variety Trials" brochure. • The level of quackgrass normally achieved with Roundup may be reduced with this tank-mix.

Active ingredient Trade name (Formulation)	Rate (active) Product per ha	Rate product per acre	Precautions For more information, see Chapter 4 Notes on Herbicides and Chapter 5 Notes on Adjuvants
Postemergence Grass and Broadleaf Herbicides — for Roundup Ready (glyphosate tolerant) varieties only (page 170)			
PRODUCT ADDITION (Highlighted in Bold)			
glyphosate ROUNDUP TRANSORB or VANTAGE PLUS or [illegible]	0.9 kg/ha 2.5 L/ha	1 L/ac	• For use only with pedigreed (certified) soybean seed designated as "ROUNDUP READY SOYBEANS" • Apply between the first trifoliate leaf stage and the full flower stage of the soybeans. • Weeds are more easily controlled and weed competition avoided when applications are made when weeds are small, although weeds up to 20 cm tall will be controlled. • A second application may be made for later flushes emerging after the initial application. • Use 100–200 L/ha (40–80 L/ac) of water.
glyphosate ROUNDUP TRANSORB or VANTAGE PLUS or [illegible]	1.8 kg/ha or 0.9 + 0.9 kg/ha 5 L/ha or 2.5 + 2.5 L/ha	2 L/ac or 1 + 1 L/ac	• For use only with pedigreed (certified) soybean seed designated as "ROUNDUP READY SOYBEANS" • Apply when milkweed, perennial sow thistle and Canada thistle are 10–60 cm and sunedge is 5–10 cm in height and actively growing for best results. • If the sequential applications are used they should be at least 2 weeks apart for best results.
NEW TANK MIXED			
glyphosate ROUNDUP TRANSORB (360 g/L) plus muscimol/pyr PLEXXIS (240 g/L)	0.9 to 1.8 kg/ha 2.5 to 5 L/ha 0.039 to 0.07 kg/ha 0.10 to 0.21 L/ha	1 to 2 L/ac 0.065 to 0.085 L/ac	• For use only with pedigreed (certified) soybean seed designated as "ROUNDUP READY SOYBEANS" • Apply between the first trifoliate leaf stage and the third trifoliate leaf stage of the soybeans. • Use only once per season. • Some rotational cropping restrictions apply (see PLEXXIS label and Table 2).
glyphosate ROUNDUP TRANSORB (360 g/L) plus quizalofop-p-ethyl ASSURE II (96 g/L) plus oil concentrate SURF-MIX or COMPLY	0.9 to 1.8 kg/ha 2.5 to 5 L/ha 0.070 kg/ha 0.50 L/ha 5 L (1000 L)	1 to 2 L/ac 0.07 L/ha	• For use only with pedigreed (certified) soybean seed designated as "ROUNDUP READY SOYBEANS" • ASSURE II is for control of volunteer corn which has the "ROUNDUP READY" Gene. • Apply to volunteer corn up to 12 inches in height. • **Do NOT** apply to soybeans within 80 days of harvest.

TABLE 1-7 Soybean Herbicide Weed Control Ratings

Trade name	Annual Grasses								Annual Broadleaves											Perennials							Crop Tolerance
	barnyard grass	crabgrass	fall panicum	foxtail giant	foxtail green	foxtail yellow	wild proso	proso millet	buckwheat wild	cocklebur	Canada	hemp	jimsonweed	lambsquarters	morningglory	nightshade eastern	pigweed	ragweed common	ragweed giant	smartweed	velvetleaf	bindweed field	bindweed hedge	milkweed	nutsedge	quackgrass	sandbur field	thistle Canada	
Soybean — postemergence grass and broadleaf herbicides — herbicide tolerant varieties only																											
ROUNDUP WEATHERMAX (requires HRS)[1]	e	e	e	e	e	e	e	e	e	e	e	s	e	e	e	e	e	e	e	e	e	fair	s	e	e	e	e	e	g[2]

[1] For use only with glyphate (certified) soybean seed designated as "ROUNDUP READY" soybeans.

TABLE 10. Soybean Post-Applied Herbicide Performance

common name	Trade Name	grass herbicide						broadleaf herbicide							grass & broadleaf				
acetolactate inhibitor																			
			✓															✓	
			✓												✓			✓	
																		✓	
			✓															✓	
		✓	✓	✓											✓	✓		✓	
			✓												✓			✓	
			✓	✓									✓		✓			✓	
			✓	✓															
			✓																
			✓																
			✓	✓					✓	✓	✓	✓	✓					✓	
cell membrane disruptor																			
											✓		✓					✓	
								✓	✓	✓	✓	✓	✓					✓	
									✓		✓	✓	✓					✓	
												✓	✓					✓	
												✓	✓					✓	
												✓	✓					✓	
cell membrane/cell wall inhibitor																			
			✓															✓	
			✓	✓														✓	
			✓															✓	
		✓	✓	✓								✓	✓					✓	
																		✓	
			✓	✓	✓	✓	✓				✓							✓	
		✓	✓	✓	✓	✓	✓				✓							✓	

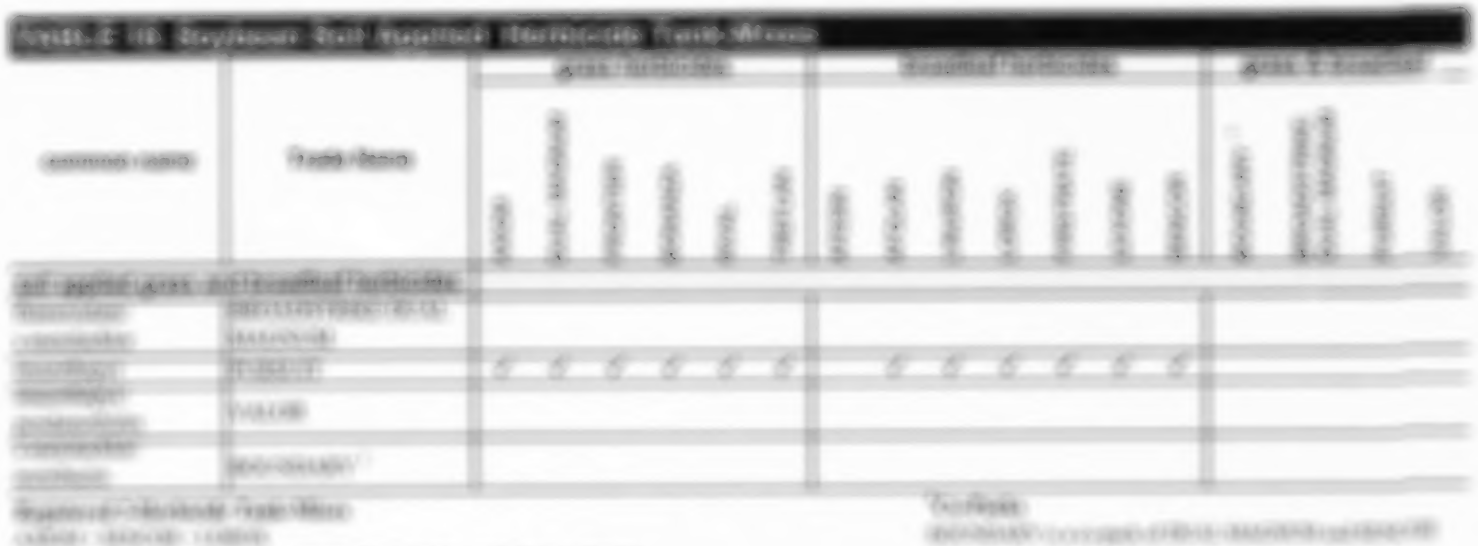

TABLE 19. Soybean Postemergence Herbicide Tank-Mixes

common name	TRADE NAME	grass herbicides						broadleaf herbicides							grass and broadleaf							
		ASSURE II	EXCEL SUPER	FUSILADE DX	PINNACLE PLUS	PUSUIT®	SELECT®	BASAGRAN	BASAGRAN FORTE	BLAZER	CLASSIC®	CHEVRON®	PINNACLE	REFLEX	SCEPTER®	HERBEXX	VIPER	PURSUIT	CLEANSWEEP®	HERBEXX PLUS®	TANK MIX®	VANTAGE®	VANTAGE PLUS®
postemergence grass herbicides																							
graminicide (ACCase)	ASSURE II									✓			✓	✓									
graminicide (ACCase)	EXCEL SUPER							✓					✓										
fluazifop (ACCase)	FUSILADE DX																						
sethoxydim	PINNACLE PLUS																						
clethodim	SELECT®																						
fluazifop (ACCase)	VANTAGE®							✓															
postemergence broadleaf herbicides																							
bentazon	BASAGRAN				✓				✓						✓								
bentazon	BASAGRAN FORTE		✓						✓				✓		✓	✓							
acifluorfen	BLAZER							✓															
chlorimuron ethyl	CLASSIC®		✓																				
chlorsulfuron methyl	GLEAN														✓								
thifensulfuron methyl	HARMONY		✓	✓				✓					✓										
fomesafen	REFLEX												✓			✓	✓						
chlorimuron ethyl/thifensulfuron methyl	SYNCHRONY®		✓																				
postemergence grass and broadleaf herbicides																							
imazethapyr	HERBEXX®							✓															
imazethapyr	VIPER®													✓									
imazethapyr	PURSUIT							✓	✓			✓		✓						✓			
postemergence grass and broadleaf herbicides — herbicide tolerant varieties only																							
glufosinate	BALVANT®																						
glufosinate	BALVANT® TRANSORB		✓																✓				
glufosinate	CHAMPION®																						
glufosinate	LIBERTY®																						
glufosinate	LIBERTY® PLUS®																						

Registered Herbicide Tank-Mixes

ASSURE + BASAGRAN FORTE + PINNACLE

EXCEL SUPER + BASAGRAN FORTE + PINNACLE

Co-Packs

[1] CLEANSWEEP is a co-pack of PURSUIT and BASAGRAN FORTE

[2] HERBEXX PLUS is a co-pack of HERBEXX and BASAGRAN FORTE

[3] VIPER is a co-pack of VIPER and REFLEX

[4] Use only on appropriate herbicide tolerant varieties

Active Ingredient TRADE NAME (*Formulation*)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)

Canola – Spring and Winter Planted (page 183)

All herbicides listed in the canola section, Chapter 12 of Publication 75, *2002 Guide to Weed Control* can be applied to winter planted canola, **EXCEPT** for MUSTER, LIBERTY 200 SN, and ROUND-UP TRANSORB, TOUCHDOWN iQ, or VANTAGE PLUS. MUSTER is only registered for use on spring planted canola, and winter planted varieties of "Liberty Link" and "Round-up Ready" canola are not commercially available.

Mustard

Preplant (PP) — See Chapter 6, **Special Methods**, **Preplant – Site Preparation** for details of products, rates and remarks.

Mustard — Soil Applied Grass Herbicides

triallate AVADEX BW (400 g/L)	1.7 to 2.2 kg/ha 4.25 to 5.5 L/ha	1.7 to 2.2 L/ac	• AVADEX can be applied before or after seeding for the control of wild oats. • Must be worked into the soil by 2 passes of cultivator.

Mustard — Soil Applied Grass and Broadleaf Herbicides

trifluralin TREFLAN EC (480 g/L) RIVAL (500 g/L) BONANZA 400 (400 g/L)	0.6 to 1.147 kg/ha 1.25 to 2.4 L/ha 1.2 to 2.3 L/ha 1.5 to 2.75 L/ha	0.5 to 0.96 L/ac 0.4 to 0.76 L/ac 0.6 to 1.1 L/ac	• Apply PPI. • Strongly absorbed to soil particles, negligible leaching. • **Do NOT** apply to mustard on sandy soils. • Can be applied immediately prior to, or up to 3 weeks before planting.

Mustard — Postemergence Grass Herbicides

diclofop-methyl HOE-GRASS 284 (284 g/L)	0.71 to 0.795 kg/ha 2.5 to 2.8 L/ha	1 to 1.12 L/ac	• Apply in the spring when annual grasses are in the 1–5 leaf stages. • The higher rate (2.8 L/ha (1.12 L/ac)) must be used for control of wild oats in the 4–5 leaf stage.

Mustard — Preharvest

diquat REGLONE DESICCANT (240 g/L) plus surfactant AGRAL 90 or AG-SURF	0.3 to 0.55 kg/ha 1.25 to 1.7 L/ha 1 L/1000 L	0.6 to 1.1 L/ac 1 L/1000 L	• Apply when crop is 60%–75% seed turn (green or brown) stage. • Harvest no later than 14 days after herbicide application to avoid pod shatter. • Use higher rate for heavy canopy. • Use minimum of 225 L/ha spray volume. • DRIFT will injure adjacent crops or plants.

Weed control ratings are given as 0–9 where 0 indicates no control and 9 indicates 90%–100% control under ideal conditions.
Ratings are subjective values based on best available information and give general comparisons based on use as described in this guide.
Under unfavorable conditions (eg., too dry, too wet, too cold, or poor application) the herbicides may not be as effective as indicated.
Ratings may vary with weed and crop stage and with the timing and rates of the product(s) being used.
Ratings in **BOLD** indicate the weed is listed on the product label for control or suppression.
Please see product label for more information on registered weed species, product uses and precautions.

TABLE 20. Canola, Flax, Mustard, Sunflowers Herbicide Weed Control Ratings

	Crop					Annual Grasses											Annual Broadleaves											Perennials						
Trade Name	canola, spring	canola, winter	flax	mustard	Sunflowers	barnyard grass	crabgrass	fall panicum	foxtail, giant	foxtail, green	foxtail, yellow	old witch grass	proso millet	wild oats	vol. corn	vol. wheat	vol. barley	buckwheat, wild	cocklebur	fleabane, Canada	lady's thumb	lamb's-quarters	wild mustard	nightshades, annual	pigweed	ragweed, common	ragweed, giant	velvetleaf	field bindweed	horsetail	milkweed	nutsedge	quackgrass	sow-thistle	thistle, Canada
soil applied grass herbicides																																			
AVADEX	✓	✓	✓	✓		?	?	?	?	?	?	?	?	**8**	?	?	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPTAM			✓		✓	**9**	**9**	**9**	**9**	**9**	**9**	**9**	7	**8**	?	?	?	**4**	2	0	**7**	**7**	5	**7**	**7**	5	3	5	?	?	?	8	5	?	?
TREFLAN, BONANZA, RIVAL	✓	✓		✓	✓	**9**	**9**	9	9	**9**	**9**	9	7	**8**	?	?	?	**5**	2	0	2	**8**	2	2	**8**	2	2	2	2	2	2	2	2	2	2
postemergence grass herbicides																																			
ASSURE II	✓	✓	✓			**9**	8	9	9	**9**	8	9	9	?	**9**	**9**	**9**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**9**	0	0
EXCEL SUPER	✓	✓				**9**	**8**	**9**	9	**9**	**9**	**9**	9	?	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
HOE-GRASS	✓	✓	✓	✓		**8**	5	**8**	8	**9**	**8**	**8**	3	**9**	**8**	?	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
POAST ULTRA	✓	✓	✓			**9**	**8**	**9**	**9**	**9**	**9**	**9**	**9**	**8**	**8**	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**6**	0	0
SELECT	✓	✓	✓		✓	**9**	**8**	**9**	9	**9**	**9**	**9**	**9**	?	?	?	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0
VENTURE L	✓	✓			✓	**9**	8	**9**	8	**8**	**8**	9	**8**	**9**	**9**	**9**	**9**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**9**	0	0
postemergence broadleaf herbicides																																			
BASAGRAN			✓			0	0	0	0	0	0	0	0	0	0	0	0	**7**	**9**	**5**	**9**	**8**	**9**	7	7	**8**	**6**	**9**	**6**	2	2	**8**	0	6	7
BUCTRIL M			✓			0	0	0	0	0	0	0	0	0	0	0	0	**9**	**8**	?	**9**	**9**	**9**	**9**	**8**	**9**	?	**9**	7	7	0	0	0	7	7
LONTREL	✓	✓				0	0	0	0	0	0	0	0	0	0	0	0	**8**	?	?	3	5	0	?	5	8	?	?	3	?	?	0	0	**8**	**8**
MCPA			✓			0	0	0	0	0	0	0	0	0	0	0	0	2	7	?	**2**	**9**	**9**	?	**9**	**9**	?	**8**	7	8	0	0	0	7	7
MUSTER	✓					0	0	0	0	0	0	0	0	0	0	0	0	2	0	?	0	2	**9**	2	**8**	2	1	0	0	0	0	0	0	0	0
postemergence grass and broadleaf herbicides — for use with herbicide tolerant canola varieties																																			
LIBERTY[4]	✓	✓				**9**	**9**	**9**	**9**	**9**	**8**	**9**	**9**	**8**	?	?	?	**8**	**9**	7	**8**	**9**	**9**	**9**	**9**	**9**	**9**	?	**8**	**6**	6	?	6	**6**	**8**	7
LIBERTY[4] + VENTURE 25G	✓	✓				**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**8**	**9**	7	**8**	**9**	**9**	**9**	**9**	**9**	?	**8**	**6**	7	?	6	**9**	**8**	7
PURSUIT[2]	✓	✓				**8**	7	7	9	**9**	**9**	8	7	8	?	?	?	8	7	2	9	**9**	9	**9**	**9**	**8**	6	**9**	2	2	2	4	5	2	2
ROUNDUP TRANSORB[3] VANTAGE PLUS[3]	✓	✓				9	9	9	**9**	**9**	**9**	9	9	**9**	9	**9**	**9**	**8**	9	8	**8**	**9**	9	**9**	**9**	9	7/8	9	8	2	7/8	?	**9**	**8**	**8**

TABLE 20. Canola, Flax, Mustard, Sunflowers Herbicide Weed Control Ratings

Trade Name	Crop					Annual Grasses											Annual Broadleaves											Perennials						
	canola, spring	canola, winter	flax	mustard	Sunflowers	barnyard grass	crabgrass	fall panicum	foxtail, giant	foxtail, green	foxtail, yellow	old witch grass	proso millet	wild oats	vol. corn	vol. wheat	vol. barley	buckwheat, wild	cocklebur	fleabane, Canada	lady's thumb	lamb's-quarters	wild mustard	nightshades, annual	pigweed	ragweed, common	ragweed, giant	velvetleaf	field bindweed	horsetail	milkweed	nutsedge	quackgrass	sow-thistle	thistle, Canada
postemergence tank-mixes																																		
POAST ULTRA + BUCTRIL M			✓			9	8	9	9	9	9	9	9	8	8	7	7	9	8	?	9	9	9	9	8	9	?	9	7	7	?	?	6	7	7
POAST ULTRA + LONTREL	✓	✓				9	8	9	9	9	9	9	9	8	8	7	7	8	?	?	3	5	0	?	5	8	?	?	3	?	?	0	6	8	8
POAST ULTRA + MCPA •			✓			9	8	9	9	9	9	9	9	8	8	7	7	2	7	?	2	9	9	?	9	9	?	8	7	8	0	0	6	7	7
POAST ULTRA + MUSTER	✓	✓				9	8	9	9	9	9	9	9	8	8	7	7	2	0	?	0	2	9	2	8	2	?	0	0	0	0	0	6	0	0
SELECT + BUCTRIL M			✓			9	8	9	9	9	9	9	9	?	?	?	?	9	8	?	9	9	9	9	8	9	?	9	7	7	?	?	7	7	7
VENTURE + LONTREL	✓	✓				9	8	9	8	8	8	9	8	9	9	9	9	8	?	?	3	5	0	?	5	8	?	?	3	?	?	0	9	8	8
VENTURE + MUSTER	✓					9	8	9	8	8	8	9	8	9	9	9	9	2	0	?	0	2	9	2	8	2	?	0	0	0	0	0	9	0	0

• Various formulations available, see Table 1. See label for specific uses and rates.

? Insufficient information available to make a rating.

[1] Use only on crops planted with certified canola seed designated as "Liberty Link" Canola.

[2] Use only on crops planted with certified canola seed designated as "Pursuit Tolerant" Canola.

[3] Use only on crops planted with certified canola seed designated as "Roundup Ready" Canola.

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
Rutabagas			
Postemergence grass herbicides (page 220)			
NEW PRODUCT			
quizalofop-p-ethyl ASSURE II (96 g/L) plus oil concentrate CANPLUS 411 or SURE-MIX	0.036 to 0.07 kg/ha 0.38 to 0.75 L/ha 5 to 10 L/1000 L 5 L/1000 L	 0.15 to 0.3 L/ac 5 to 10 L/1000 L 5 L/1000 L	▪ Apply to emerged annual grasses and volunteer cereals in the 2-leaf to tillering stage, and volunteer corn and quackgrass in the 2–6 leaf stage. ▪ Use the 0.38 L/ha (0.15 L/ac) rate of ASSURE II for control of volunteer corn, volunteer cereals and green foxtail. ▪ The 0.5 L/ha (0.2 L/ac) rate of ASSURE II will suppress quackgrass and also control barnyard grass. ▪ Use the 0.75 L/ha (0.3 L/ac) rate of ASSURE II for control of quackgrass. ▪ Use the higher rate of CANPLUS 411 when wild oats and quackgrass are the target weeds or under drought conditions.
Tomatoes (Transplanted) — Postemergent Grass and Broadleaf Herbicides			
Postemergence broadleaf herbicides (page 230)			
NEW PRODUCT — FRESH MARKET TOMATOES			
rimsulfuron PRISM (25 DF) plus non-ionic surfactant CITOWETT PLUS, AGRAL 90 or AG-SURF	15 g/ha 60 g/ha 0.2 % v/v 2 L/1000 L water	 24 g/ac 0.2 % v/v 2 L/1000 L water	▪ Apply POST when hairy nightshade is up to the 4 leaf stage, quackgrass is in the 3–6 leaf stage (less than 10 cm tall), annual grasses are in the 1–6 leaf stage and redroot pigweed is at the 4–6 leaf stage. ▪ Apply **ONLY** once per year. ▪ **Do NOT** apply if rainfall is expected within 2 hr of application. ▪ Preharvest interval is 30 days. ▪ **May be used on processing and fresh market tomatoes.**
NEW PRODUCT			
thifensulfuron methyl PINNACLE (75% DF) plus non-ionic surfactant AGRAL 90	4.125 to 6.0 g/ha 5.5 to 8.0 g/ha 0.2 % v/v 2 L/1000 L water	 2.2 to 3.2 g/ac 0.2 % v/v 2 L/1000 L water	▪ Apply 3 weeks after transplanting to weeds less than 10 cm tall. ▪ Add PINNACLE to the spray tank and agitate, then add AGRAL 90. ▪ **Do NOT** apply in less than 100 L water/ha. ▪ **Do NOT** apply if rain is expected within several hours. ▪ Apply **ONLY** once per year. ▪ **Do NOT** apply to tomatoes that are stressed. ▪ **Do NOT** apply within 45 days of harvest.

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
Strawberries — First (Planting) Year — Late Fall			
First (Planting) Year – Late Fall — Soil applied grass and broadleaf herbicides (page 245)			
Harvesting Year – Late Fall - Soil applied grass and broadleaf herbicides (page 250)			
NEW PRODUCT			
oxyfluorfen GOAL 2XL (240 g/L)	0.24 kg/ha 1.0 L/ha	 0.4 L/ac	▪ Apply in 500 L water/ha ▪ Apply **ONLY** once per year as a ground application. ▪ Apply to dormant plants before applying mulch in late fall. ▪ For control of labeled weeds plus field pansy and wood sorrel (oxalis). ▪ **Do NOT** apply within 150 days of harvest.
Brush Control			
Stem Foliage Treatments Applied to "Runoff"— Most deciduous woody species (page 299)			
PRODUCT ADDITION (see highlighted in bold)			
dicamba VANQUISH (480 g/L) plus dichlorprop/ 2,4-D DIPHENOPROP BK 700 (679 g/L) **or DESORMONE (680 g/L)**	2.5 kg/1000 L 5.2 L/1000 L 4.9 kg/1000 L 7.15 L/1000 L **7.15 L/1000 L**		▪ For white ash and sugar maple. ▪ Apply to the point of runoff when leaves are fully expanded.
dichlorprop/ 2,4-D DIPHENOPROP BK 700 (679 g/L) **or DESORMONE (680 g/L)** or ESTAPROP (582 g/L) or DICHLORPROP D (582 g/L)	5.1 to 6.8 kg/1000 L 7.5 to 10 L/1000 L **7.5 to 10 L/1000 L** 8.75 to 11.7 L/1000L 8.75 to 11.7 L/1000 L		▪ Apply the **low-volatile ester** in areas dominated by species expected to be tolerant to 2,4-D alone.
Basal-Bark Treatments in Oil as a Carrier (page 301)			
PRODUCT ADDITION (see highlighted in bold)			
dichlorprop/ 2,4-D DIPHENOPROP BK 700 (679 g/L) **or DESORMONE (680 g/L)** or ESTAPROP (582 g/L) or DICHLORPROP D (582 g/L)	1.9 to 3 kg/100 L 2.8 to 4.4 L/100 L **2.8 to 4.4 L/100 L** 3.2 to 5.2 L/100 L 2.3 L/100 L		▪ For most woody species, including conifers. ▪ Use the **low-volatile ester** formulations in fuel oil. ▪ Spray bark to wet only.

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
CHANGE IN PRECAUTIONS (see highlighted in bold)			
triclopyr GARLON 4 (480 g/L)	9.6 to 14.4 kg/100 L 20 to 30 L/100 L		▪ For most woody species, not including conifers. ▪ Apply a 20-30% solution mixed in mineral or vegetable oil. ▪ One Sided Low Volume — This low volume treatment can be applied to stems less than 15 cm in diameter. Apply the spray to thoroughly wet at least one side of the stem and root crown but not to the point of run-off. ▪ Streamline — Apply sufficient spray to one side of stems less than 8 cm in basal diameter to form a band that is 5 cm in width. The treatment zone should widen to encircle the stem within 30 minutes. Treat both sides of stems which are 8–12 cm in basal diameter.
Stump Treatment After Cutting to Most Deciduous Woody Species			
PRODUCT ADDITION (see highlighted in bold)			
dichlorprop/ 2,4-D DIPHENOPROP BK 700 (679 g/L) **or DESORMONE (680 g/L)** or ESTAPROP (582 g/L) or DICHLORPROP D (582 g/L)	1.9 kg/100 L 2.8 L/100 L **2.8 L/100 L** 3.25 L/100 L 3.25 L/100 L		▪ Apply in oil as a carrier.
Evergreen or Conifer Control			
Stem Foliage Treatments with Water as a Carrier — Mixed stands (Conifers and Deciduous, page 302)			
PRODUCT ADDITION (see highlighted in bold)			
dicamba VANQUISH (480 g/L) dichlorprop/ 2,4-D DIPHENOPROP BK 700 (679 g/L) **or DESORMONE (680 g/L)**	2.5 kg/1000 L 5.2 L/1000 L 4.9 kg/1000 L 7.15 L/1000 L **7.15 L/1000 L**		▪ Apply in spring or early summer. ▪ Thorough coverage is needed. ▪ Follow instructions on VANQUISH label for tank-mix.
CHANGE IN PRECAUTIONS (see highlighted in bold)			
picloram/ 2,4-D TORDON 101 ((1:3.7)305 g/L)	3.05 kg/1000 L 10 L/1000 L		▪ Apply when the conifers are actively growing in early summer. ▪ Spray should thoroughly wet all plant parts including stem, foliage, and root collar. ▪ **Add 0.25% v/v solution of Sylgard 309 surfactant when controlling conifers.** ▪ A permit is required for purchase and use.
picloram/ 2,4-D TORDON 101 ((1:3.7)305 g/L)	6.71 to 7.62 kg/ha 22 to25 L/ha	7.2 to 10 L/ac	▪ Apply in 450 L/ha (180 L/ac) water as a constant volume foliar application during the period of active conifer growth in early summer. ▪ **Add 6.25% - 0.375% v/v solution of Sylgard 309 surfactant when controlling conifers.** ▪ A permit for purchase and use is required.

Active Ingredient TRADE NAME (Formulation)	RATE (active) PRODUCT PER HA	RATE PRODUCT PER ACRE	PRECAUTIONS (For more information, see Chapter 4: Notes on Herbicides and Chapter 5: Notes on Adjuvants.)
Perennial Weed Control (Non Crop Land)			
Postemergence Broadleaf Herbicides (page 304)			
PRODUCT ADDITION (see highlighted in bold)			
dichlorprop/ 2,4-D DIPHENOPROP BK 700 (679 g/L)	2.375 kg/ha 3.5 L/ha	1.4 L/ac	• Apply as a **low-volatile ester** in 200–600 L/ha water (80–240 L/ac) during the month of May or in early fall. • Can also be used for Roadside weed control (see page 307).
or DESORMONE (680 g/L)	**3.5 L/ha**	**1.4 L/ac**	
or ESTAPROP (582 g/L)	4 L/ha	1.6 L/ac	
or DICHLORPROP D (582 g/L)	4 L/ha	1.6 L/ac	
picloram/ 2,4-D **TORDON 101** **((1:3.7)305 g/L)**	**2.135 kg/ha** **7 L/ha**	**2.8 L/ac**	• **For Canada thistle, sweet and red clover, wild carrot, common ragweed, goldenrod, dock, plantain, prickly lettuce, burdock, fleabane and vetch.** • **Apply in 200 L/ha of water as a constant volume foliar application.** • **Apply when weeds are actively growing.** • **Do not allow drift on susceptible vegetation such as beans, peas, vegetable crops, gardens or shelterbelts.** • **A permit is required for purchase and use.**
Preemergence / Postemergence Grass and Broadleaf Herbicides (page 304)			
PRODUCT ADDITION (see highlighted in bold)			
diuron **DIUREX 80W (80 WP)**	**8.8 to 22 kg/ha** **11 to 27.5 kg/ha**	**4.4 to 11 kg/ac**	• **Apply this rate on sands and sandy loam soils.**
diuron **DIUREX 80W (80 WP)**	**32 to 44 kg/ha** **40 to 55 kg/ha**	**16 to 22 kg/ac**	• **Apply this rate on clays or high organic soils.**
Vegetation Control — Long Term Non-selective			
Bare Areas — Non selective control of all vegetation (page 308)			
PRODUCT ADDITION (see highlighted in bold)			
diuron **DIUREX 80W (80 WP)**	**8.8 to 22 kg/ha** **11 to 27.5 kg/ha**	**4.4 to 11 kg/ac**	• **Apply this rate on sands and sandy loam soils.**
diuron **DIUREX 80W (80 WP)**	**32 to 44 kg/ha** **40 to 55 kg/ha**	**16 to 22 kg/ac**	• **Apply this rate on clays or high organic soils.**

REPLACE APPENDIX I with new one below.

APPENDIX I. HERBICIDE COMPANIES AND AGENTS

CODE	NAME	PHONE	WEB PAGE
APB	APPLIED BIOCHEMISTS INC.	1-800-558-5106	www.appliedbiochemists.com/
ARV	AGREVO CANADA INC.	1-877-939-3737	www.bayercropscience.ca
AET	AVENTIS CROPSCIENCE CANADA CO.	1-877-939-3737	www.bayercropscience.ca
ATC	ICI SURFACTANTS	1-519-756-6181	www.surfactant.com/
BAT	BARTLETT, N.M. INC.	1-905-563-8261	
BAZ	BASF CANADA INC.	1-877-371-2273	www.agsolutions.ca/
BBB	BAYER INC.	1-877-939-3737	www.bayercropscience.ca
CAU	CHEMINOVA CANADA	1-888-316-6260	www.cheminova.com/
BAZ	CYANAMID CROP PROTECTION	1-877-371-2273	www.agsolutions.ca/
DCS	DOW CORNING	1-800-663-4300	www.dowcorning.com/
DUQ	DUPONT CANADA INC.	1-800-667-3925	www.dupont.ca/ag/
DWE	DOW AGROSCIENCES CANADA INC.	1-800-667-3852	www.dowagro.com/canada/
EFA	ELF ATOCHEM of CANADA LTD.	1-905-827-9941	www.elf-atochem.com/news/homepage.cfm
GOW	GOWAN COMPANY	1-520-783-8844	www.gowanco.com
GRC	GREAT LAKES CHEMICAL CORPORATION		www.greatlakescorp.com/
GRN	GRIFFIN CORP.	1-912-242-8635	www.griffinllc.com
INT	INTERPROVINCIAL COOPERATIVE LIMITED	1-204-233-3461	
LOV	LOVELAND INDUSTRIES INC.	1-800-356-4920	
MOX	MONSANTO CANADA INC.	1-800-667-4944	www.monsanto.com/
NLC	NALCO CANADA INC.	1-905-623-8791	www.nalco.com/
NOR	NORAC CONCEPTS INC.	1-613-841-2907	www.noracconcepts.com/
NUA	NUFARM AGRICULTURE INC.	1-800-868-5444	www.nufarm.ca/
NUG	NU-GRO CORPORATION	1-519-456-2021	www.nugro.com/
PLG	PLANT PRODUCTS CO. LTD.	1-800-387-2449	www.plantprod.com/
RHQ	RHONE-POULENC CANADA INC.	1-877-939-3737	www.bayercropscience.ca
SAF	SANEX INC.	1-905-602-5100	
ROH	ROHM & HAAS CANADA INC.	1-800-667-3852	www.dowagro.com/canada/
SGF	SCOTTS CANADA LTD.	1-800-668-5669	www.scottslawn.com/
STD	STANCHEM INC.	1-416-259-8231	
SYN	SYNGENTA CROP PROTECTION CANADA INC.	1-800-459-2422	www.syngenta.ca
SWC	SWANCO CANADA INC.	1-905-873-2204	
UAG	UNITED AGRI PRODUCTS	1-800-265-4624	www.uap.ca/
UNR	UNIROYAL CHEMICAL	1-800-265-2157	www.uniroyalchemical.com/
TOM	TOMEN AGRO INC.	1-519-756-0415	www.tomenagro.ca
VAR	VAN WATERS & ROGERS LTD.	1-800-265-7671	www.vwr-ltd.com/
WBR	WILBUR-ELLIS COMPANY OF CANADA LTD.	1-306-242-4553	www.wilburellis.com/
	ONTARIO PESTICIDES ADVISORY COMMITTEE	1-416-314-8733	www.opac.gov.on.ca/
	OMAF WEEDS PAGE		www.gov.on.ca/OMAF/english/crops/insects/weeds.html
	PEST MANAGEMENT REGULATORY AGENCY		www.hc-sc.gc.ca/pmra-arla/
	WEED SCIENCE SOCIETY of AMERICA		cel.agh.uiuc.edu/wssa/

Discard old editions of this publication. Each year the Ontario Weeds Sub-committee of the Ontario Pest Management Research and Services Committee reviews the pesticides listed in this publication. To the best knowledge of the committee, at the time of printing, all of these pesticides were:

- federally registered
- reviewed by the Ontario Pesticides Advisory Committee (OPAC)
- classified by the Ministry of the Environment as of November 2002

The information in this publication is general information only. By printing this publication, the Ministry of Agriculture and Food does not offer any warranty or guarantee, nor does it assume any liability for any crop loss, animal loss, health, safety or environmental hazard caused by the use of a pesticide mentioned in this publication.

The pesticide product label is a legal document. It is against the law to use the product in any other way. You must also use all pesticides in accordance with the Pesticides Act and Regulation 914, administered by the Ontario Ministry of the Environment.

This publication lists a number of brand names of pesticides. This is for your convenience only. It is neither an endorsement of the product nor a suggestion that similar products are ineffective.

Consult each product label for specific information such as compatibility with other materials and the effect of environmental conditions. Weather and other factors influence the effectiveness of pesticides and the likelihood of crop injury.

Health Canada has established maximum residue limits (MRLs) for pesticides. Processors or retailers may demand more restrictive limits. Growers should seek advice of their [illegible] and market as to which restrictions or limitations apply. Keep accurate and up-to-date records of pesticide use in each crop.

Federal Registration of Pesticide Products

The Pest Management Regulatory Agency (PMRA) of Health Canada grants registration following an evaluation of scientific data to ensure that the product has merit and value, and the human health and environmental risks associated with its proposed use are acceptable.

1. Full Registration

Pesticide registrations are normally granted for a period of five years, subject to renewal.

2. Temporary Registration

Temporary registration may be granted for a period not to exceed one year, where the registrant agrees to produce additional scientific or technical information, or the pesticide is used for emergency control of a serious pest outbreak.

Supplemental Labels

You MUST obtain a supplemental label and follow all the label directions when PMRA approves new uses for a registered pesticide that do not appear on the current label.

Examples of when you must use a supplemental label include:

- **Temporary Registrations for Emergency Use**
- **Minor Use Label Expansion (new label statements for crops that do not already appear on that product label)**

You can obtain a copy of a supplemental label from the pesticide manufacturer or pesticide vendor, the grower association that sponsored the emergency registration or minor use, from CleanIT or PMRA's Pest Management Information Service.

For more information on the federal registration status check the PMRA web site at www.hc-sc.gc.ca/pmra-arla or call 1-800-267-6315.

Regulation of Pesticides in Ontario

Classification of Pesticides into "Schedules"

The Ministry of the Environment classifies all pesticide products into one of six **schedules**, based on the potential hazards that product may have for human health and the environment. For up-to-date information on the regulatory status of any pesticide check the Ontario Pesticides Advisory Committee Web site at www.ipm.gov.on.ca or call (416) 314-5900 or fax (416) 314-5901.

Licensing and Certification Requirements for Pesticide Users

You must be a certified grower or licensed exterminator to buy and use Schedule 1, 2 and 5 pesticides.

Requirements for Growers and Their Assistants

Growers must be certified through the **Grower Pesticide Safety Course** to buy and use Schedules 1, 2 or 5 pesticides on land they farm. There must be at least one certified grower for each farm operation.

All agricultural assistants must also receive formal pesticide safety training, recognized by the Ministry of the Environment, before they can use Schedule 2 or 5 pesticides under the supervision of a certified grower. This applies to all assistants — including family members, farm employees and seasonal workers.

For more information about training for growers and agricultural assistants check the Ontario Pesticide Education Program Web site at www.ridgetown.uoguelph.ca/opep/ or call 1-888-652-6775.

Requirements for Commercial Applicators and Their Assistants

If you plan to apply pesticides as a business, you must be a licensed exterminator. **This includes farmers who custom apply pesticides for other farmers and charge a fee for this service.** You must complete a home study course and certification exams, and send proof of certification to the Ministry of Environment to obtain your license.

Unlicensed assistants must be **Technicians** before they may handle Schedule 2 (with restrictions), 3, 4 and 5 products under indirect supervision of a licensed exterminator. Technicians may not handle Schedule 1 and 5 products. For more information about exterminators and technicians check the Ontario Pesticide Training & Certification Web site at www.ridgetown.uoguelph.ca/opep/ or call 1-888-629-6999.

Cette publication est aussi disponible en français.

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